

## ABSTRACT

- A piezoelectric actuator is disclosed including an annular piezoelectric element and a base. There is a gap along the radial direction of the annular piezoelectric element. One of the two ends, i.e., the fixed end of the said annular element, is connected to the base, while the other end is free. The base is made of piezoelectric materials. Furthermore, the annular element is divided into two or more annular parts along the direction of its circumference by the electrode patterns applied on its two opposite surface and/or its polarization directions. When driving voltages are applied, the actuator can generate roughly a rotary motion around the center of the annular piezoelectric element. The annular rotary actuator could be either a single plate or with multilayer structure. The present invention further relates to a dual stage head positioning actuator system of a hard disk drive with a plurality of disks and a plurality of vertically aligned head sliders mounted on distal ends of a plurality of suspensions via the annular piezoelectric actuators.